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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/259,762	03/01/1999	ZHIPING YIN	303.531US1	5661

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EXAMINER

DIAZ, JOSE R

ART UNIT	PAPER NUMBER
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2815

DATE MAILED: 05/06/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/259,762

Applicant(s)

YIN ET AL.

Examiner

José R. Díaz

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 12 February 2002.
- 2a) ☒ This action is FINAL. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-3 and 5-11 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-3, 5-11 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s) _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 102

➤ The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) do not apply to the examination of this application as the application being examined was not (1) filed on or after November 29, 2000, or (2) voluntarily published under 35 U.S.C. 122(b). Therefore, this application is examined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

➤ Claims 1-2, 5 and 9-11 rejected under 35 U.S.C. 102(e) as being anticipated by Puntambekar (US Pat. No. 5,821,603).

Regarding claim 1, Puntambekar teaches a plasma surface treatment method (see columns 1-10) comprising: providing a semiconductor substrate (41) comprising a film (42) (See Figure 6a); treating the film (42) in a vacuum of about 3.0-6.5 Torr (See Table II and col. 6, lines 18-22), for a time of about 10 seconds to about 5 minutes (See col. 6, lines 26-27), and in an atmosphere comprising oxygen plasma wherein the oxygen plasma flow rate is at least about 300 sccm oxygen (See col. 6, lines 13-17 and 24-26) thereby rendering the substrate resistant to profile distortion to make a treated

substrate (See col. 5, lines 62-67 and col. 6, lines 1-3); applying a resist (45) to the treated substrate and patterning the resist (See col. 6, lines 61-65).

Regarding claim 2, Puntambekar teaches exposing oxygen gas to an energy source generating about 400 watts in order to make the oxygen plasma (See Table II).

Regarding claim 5, Puntambekar teaches that the oxygen plasma is made by an exposure of oxygen gas to an energy source that is RF energy (See Table II).

Regarding claim 9, Puntambekar teaches removing the resist (45) from the film (See Figures 6(a)-6(d)).

Regarding claim 10, Puntambekar teaches that the oxygen flow rate is not greater than about 2000 sccm (See column 6, lines 24-26).

Regarding claim 11, Puntambekar teaches adding an inert gas (e.g. argon) to the oxygen gas (see col. 6, lines 24-30)

Claim Rejections - 35 USC § 103

➤ The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation

under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

➤ Claim 3 and 6-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Puntambekar (US Patent No. 5,821,603).

Regarding claim 3, Puntambekar teaches that the oxygen plasma is made by electromagnetic excitation of oxygen gas by electrodes (see col. 6, lines 23-30 and Table II). Regarding the range of separation of the electrodes, it would have been obvious to one of ordinary skill in the art, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or working ranges involves only routine skill in the art. In re Aller, 105 USPQ 233.

Regarding claim 6, Official Notice is taken with respect to the limitation wherein the oxygen plasma is made by an exposure of oxygen gas to an energy source that is microwave energy since it is well known in the art that using microwave energy is an alternative method of forming an oxygen plasma (See for example Spencer et al. US Patent No. 4,673,456).

Regarding claims 7-8, Official Notice is taken with respect to the limitation of reducing footing and undercutting since one of ordinary skill in the art recognizes that the nitride treatment of Puntambekar, which is performed under the same operational parameters that Applicant claimed, would result in the reduction of such footing or undercutting profile distortion.

Response to Arguments

➤ Applicant's arguments filed February 12, 2002 have been fully considered but they are not persuasive. Applicant essentially argues that the "...claims of the present invention utilize an oxygen flow rate much greater than is described in the Puntambekar" and "...do not identify a use of argon..." Examiner disagrees. Puntambekar, as stated in the prior office Action, clearly teaches the claimed flow rate of at least about 300 sccm in Table II and col. 6, lines 24-65. Specifically, Puntambekar discloses that the oxygen flow rate ranges from 10-500 sccm (see col. 6, lines 24-25). With regards to the argon gas, Applicant clearly teaches the use of an inert gas in combination with the oxygen (see for example claim 11) and one of ordinary skills in the art recognizes that argon is an inert gas of the group VIIIA. Thus, Applicant's arguments are not persuasive since the reference Puntambekar anticipates the claimed invention.

Conclusion

➤ **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

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the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Correspondence

Any inquiry concerning this communication or earlier communications from the examiner should be directed to José R. Díaz whose telephone number is (703) 308-6078. The examiner can normally be reached on 9:00 - 5:00 Monday, Tuesday, Thursday and Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Eddie C. Lee can be reached on (703) 308-1690. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-7722 for regular communications and (703) 746-3891 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

JRD
May 2, 2002



EDDIE LEE
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800